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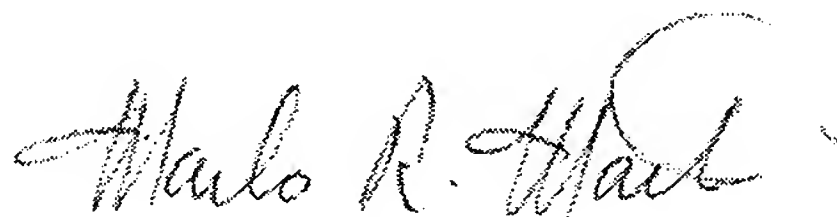
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March 4, 2008

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### CERTIFICATION OF TRANSLATION

This is to certify that the attached Traditional Chinese (Taiwanese) to English translation has been translated by a qualified professional translator competent in both languages, and is an accurate and complete rendering of the content of the original document to the best of our ability. The following document is included in this certification, Taiwanese Patent Application No. 092122825.



Marlo R. Martin, Ph.D.  
Director

## **V. Description of the Invention**

### **Technical Field of the Invention**

The present invention provides a file management method for a digital device. In particular, it relates to a method of creating file folders corresponding to the file types of files generated under various operating modes of said digital device and of storing in the generated file folders files acquired by said digital device, such storage being based on the file types corresponding to the operating modes of the digital device.

### **Prior Art**

The information industry is developing vigorously. At the same time, information-related products are being applied to everyday life and work. They are replacing traditional analogue tools and are leading users into a digital world. Digital cameras, both still and video cameras, are good examples. For example, traditional optical cameras require the photosensitivity of chemical substances on film negatives to record images which appear before the user after a complex process that includes photographic development. Furthermore, if the user wants to take photographs that have special effects, he must carefully control the aperture and shutter or employ methods such as special lens filters or development techniques. This is very inconvenient for users who are not adept at operating the camera. Unlike traditional optical cameras, digital cameras record image information digitally and use photosensors to convert images into digital signals, which are stored in a computer graphic file format in a memory device. Digital cameras can be connected to computer systems and store images on hard disks. The images can also be displayed on display devices or be output via printers. Therefore, one may immediately view the picture-taking results. In addition, users can use image-processing utilities for further processing of image files recorded by digital cameras. They can also create the special effects that are possible with traditional optical cameras as well as effects that are impossible with traditional optical cameras.

Please refer to FIG. 1. FIG. 1 is a front view of a conventional digital camera 10. The digital camera 10 comprises a lens 12 for capturing scenes that are to be photographed. One optical viewfinder 14. The user may, by means of light entering the optical viewfinder 14, view the scene that is to be photographed. One shutter button 16. By pressing the shutter button 16, the user may focus and perform picture-taking functions. Please refer to FIG. 2. FIG. 2 is a rear view of the digital camera 10 of FIG. 1. The digital camera 10 further comprises an electronic viewfinder 18, which can provide the user with another viewfinding option in addition to that of the optical viewfinder 14. The electronic viewfinder 18 can be a display device such as a liquid crystal display (LCD) or a low-temperature polysilicon display (LTPS). There is also a control button set 20. By means of the control button set 20, the user may perform such tasks as editing images, browsing, and setting picture-taking parameters. A difference between the conventional digital camera 10 and traditional film cameras lies in the fact that, before and after taking a picture, the user may, by means of the electronic viewfinder 18 provided by the digital camera 10, preview the scene to be photographed or browse photographs that have already been taken, without need for a smaller optical viewfinder 14 to view the scene to be photographed. In addition, after photographs have been taken, the user may browse the photographed images on the electronic viewfinder or choose to delete them.

Although digital cameras 10 have become more and more common by the day, it is by no means easy to organize the large numbers of files generated by digital cameras 10. In particular, the

functions of digital cameras have become increasingly powerful. They can support many operating modes. For example, they can take pictures to generate still image files (such as .jpg, .gif, and .bmp file types). They can also shoot videos and thus generate video files (such as .avi and .mpg file types). And they can make audio recordings and thereby generate audio files (such as .wav and .mp3 file types) and various other forms of multimedia files. Yet the file management method for existing digital cameras 10 consists of automatically giving a file a filename after the file has been generated or captured. However, these filenames are no more than strings of numbers and are not named by the users themselves. Moreover, files of various file types are stored in the same file folder. For example, there is currently an agreement in the industry to store all files of different file types in DCIM folders. In addition, if one wishes to create file folders with other names, it will not be possible to open files stored in the differently-named file folders in the digital camera. Please refer to FIG. 3. FIG. 3 is a diagram, shown through an electronic viewfinder 18, of files stored on the digital camera 10 of FIG. 2. Suppose that the digital camera 10 stored still photograph files (DC001-DC003 of FIG. 3), video files (DC004-DC006 of FIG. 3), and audio files (DC007-DC009). Thus, various types of files are generated and placed in the same directory, which makes file management messy and inconvenient. In addition, if a user wants to locate a certain type of file for browsing or for viewing and listening and/or downloading to a computer, the user must use the control button set 20 to select files of this type one by one in order to determine which ones are the ones he or she wants. As a result much valuable time is wasted.

In addition, as various kinds of portable information devices become more common with every passing day (take for example the popularity of digital still cameras, digital video cameras, mobile telephones, personal digital assistants (PDAs), and MP3 players), information is being exchanged and shared between the various different type of digital devices through increasingly close links. And as wireless networks become widely available, transmission and exchange of information between different devices should become even more convenient. However, since the file management systems of all the various types of digital devices are different, there are obstacles to the exchange and transmission of information between the different types of digital devices.

### **Contents of the Invention**

To solve the above problems, the present invention provides a file management method for digital devices.

The claims of the present invention disclose a file management method for digital devices. It includes the following steps: (a) creating file folders corresponding to the file types of files generated under various operating modes of said digital device; and (b) of storing files, which were acquired by said digital device, in the file folders generated in step (a), according to the file types corresponding to the operating modes of the digital device.

The claims of the present invention disclose a type of digital device, which has a plurality of operating modes. Said digital device comprises: a receiving module for capturing files; a control module for switching between the operating modes of said digital device; a file folder-generating module for creating file folders corresponding to the file types of files generated under the various operating modes of said digital device; and a memory module for storing, in accordance with the file types of the files acquired by said receiving module, files in the corresponding file folders generated by said file folder-generating module.

## Embodiments

Please refer to FIG. 4 and FIG. 5. FIG. 4 is a front view of the image-capturing device 30 of the present invention. FIG. 5 is a rear view of the image-capturing device 30 of the present invention. The image-capturing device 30 may be a digital camera or a digital camcorder. The image-capturing device 30 comprises a lens 32 for capturing the scene to be photographed, an optical viewfinder 34 (users may, by means of light entering the optical viewfinder 34, view the scene that is to be photographed), an electronic viewfinder 36, which can provide users a viewfinding option in addition to that of the optical viewfinder 34 (the electronic viewfinder 36 possibly being a display device such as a liquid crystal display or a low-temperature polysilicon display), and a control button set 38. Users may perform such tasks as editing, browsing, or setting photography parameters by operating the control button set 38. The control button set 38 is provided with a hot key 40, which upon being triggered allows one to browse information stored in a file folder of a certain type or to transmit information that has been stored in a file folder of a certain type to another digital device. The image-capturing device 30 further comprises a control module selection knob 42. By turning the control module selection knob 42, users may decide under which operating mode to operate.

Please refer to FIG. 6. FIG. 6 is a functional diagram of the image-capturing device 30. The image-capturing device 30 further comprises an image-capturing module 43, which itself comprises a lens 32 and an image sensor 44, which converts light signals received by the receiving lens 32 into electrical signals (the greater the number of pixels, the higher the resolution of the photographic image; it can comprise a plurality of charge coupled devices (CCD) or comprise a plurality of complementary metal-oxide semiconductors (CMOS)), an audio-recording module 45 for receiving sound signals, and a control unit 46 for processing image signals sent from the image sensor 44 where they were taken or recorded and audio signals sent from the audio-recording module 45 where they were recorded and for handling the operation of the image-capturing device 30. It comprises a file-generating module 47 for creating file folders corresponding to the file types of the files generated under the various operating modes of the image-capturing device 30. The image-capturing device 30 further comprises: a memory device 48 for storing still photographs or videos that have been taken or recorded and audio files, this memory possibly being flash memory, such as the CF and SD cards common in the business, read-only memory, such as an optical disk, or a miniature disk drive; and a transmitting module 50, which can transmit information in a wired or wireless transmission format. For example, it may transmit information through USB or IEEE1394 cables, by employing infrared or Bluetooth wireless area network protocols, or by the transmission methods of other interfaces.

Please refer to FIG. 7. FIG. 7 is a file management flow chart of a first embodiment of the image-capturing device 30. The method of the present invention comprises the following steps:

Step 100: The control module selection knob 42 of the image-capturing device 30 decides under which operating mode the image-capturing device 30 will operate.

Step 102: In the memory device 48 of the image-capturing device 30, create a file folder corresponding to the file type of the file generated under the operating mode selected in step 100.

Step 104: Take the file acquired by the image-capturing device 30 and, based on the file types corresponding to the operating modes of the digital device 30, store in the file folder generated in step 102.



The above steps will be further described in detail here: By turning the control module selection knob 42, the user may decide under which operating mode to operate. These operating modes may include a general picture-taking mode, a video-shooting mode, or an audio-recording mode. When the user employs the control module selection knob 42 to select under which mode to operate, the file folder-generating module 47 of the control unit 46 will automatically create, in the memory device 48 of the image-capturing device 30, a file folder corresponding to the file type of the file generated under the operating mode selected in step 100. For example, if the user employs the control module selection knob 42 to select the picture-taking mode, the file folder-generating module 47 will, in the memory device 48 of the image-capturing device 30, automatically create a file folder corresponding to what was generated under the picture-taking mode or to the corresponding still picture file type (e.g., .jpg, .gif, or .bmp file type). If the video-shooting mode is selected, the file folder-generating module 47 will, in the memory device 48 of the image-capturing device 30, automatically create a file folder corresponding to what was generated under the video-shooting mode or to the corresponding video file type (e.g., .avi or .mpg file type). Or, if the audio-recording mode is selected, the file folder-generating module 47 will, in the memory device 48 of the image-capturing device 30, automatically create a file folder corresponding to what was generated under the audio-recording mode or to the corresponding audio file type (e.g., .wav or .mp3 file type). Please refer to FIG. 8. FIG. 8 is a diagram of file folders that are stored in the memory device 48 of the image-capturing device 30 and that correspond to the various operating modes. Supposing that, in the memory device 48 of the image-capturing device 30, the file folder-generating module 47 created a "My Picture Files" file folder corresponding to the picture-taking mode, a "My Video Files" file folder corresponding to the video mode, and a "My Audio Files" file folder corresponding to the audio-recording mode. In this way, files acquired by the image-capturing device 30, based on the file types corresponding to the operating modes of the image-capturing device, can be stored into the file folders in FIG. 8. For example, the files named DC001-DC003 in FIG. 8 could be still image files, DC004 and DC005 could be video files, and DC007 and DC008 could be audio files.

Files acquired here by the image-capturing device 30 can be image information captured by the lens 32 under the picture-taking or video mode and converted into still image files or video files, or they can be audio files recorded by the audio-recording module 45 under the audio-recording mode. The different types of files generated under the different modes will be automatically stored into the file folders corresponding to the file types. As for methods of comparison, the file folder names generated in step 102 can be compared with the file extensions. Those files that match up are stored into the file folders generated in step 102. The method whereby the image-capturing device acquires files may also consist of a transmitting module 50 receiving files transmitted from other devices. For example, if a computer device sends a graphics file (such as a file type having a .jpg, .gif, or .bmp file extension), the transmitting module 50 can receive this file and automatically store it into the "My Picture Files" file folder in the memory device 48. Or if it receives a motion picture file (such as a file type having an .avi or .mpg file extension), it automatically stores the file into the "My Video Files" file folder in the memory device 48. These file folders can also be given other names. Any name is acceptable so long as it helps the user classify the files. If the image-capturing device receives a file from an external source, but has not previously created in the memory device 48 a file folder corresponding to said file, the control module will automatically create in the memory device 48 a file folder corresponding to said information type when the image-receiving device 30 receives said file information. Moreover, it will store the received file into the file folder that it creates.

When a user wishes to open a file in a certain file folder, the control unit 46 can use an application program corresponding to the file folder name generated in step 102 to open a file stored in the memory device 48. For example, if the user wishes to open file DC001 in FIG. 8, the control unit 46 can open file DC001 with a picture-viewing or image-editing program corresponding to the "My Picture Files" file folder name under which DC001 is stored. If the user wishes to open file DC004 in FIG. 8, the control unit 46 can open file DC004 with a video-playing program corresponding to the "My Video Files" file folder name under which DC004 is stored. If the user wishes to open file DC007 in FIG. 8, the control unit 46 can open file DC007 with an audio-playing program corresponding to the "My Audio Files" file folder name under which DC007 is stored.

The image-capturing device 30 can use the hot-key 40 input method to set a shortcut command. When this shortcut command is executed, a file stored in the corresponding file folder is transmitted to another digital device. For example, a shortcut command can be set for the hot key 40 such that, when the hot key 40 is pressed, all the picture files in the "My Picture Files" file folder can be delivered to another digital device, such as a computer device, connected to the image-capturing device 30. It is also possible to select individual files in the "My Picture Files" file folder and then to send them to another digital device. File information can be transmitted from the transmitting module 50 to another digital device by means of wired or wireless network technology, such as USB or IEEE 1394 cables, infrared or Bluetooth wireless area network protocols, or other interfaces.

Please refer to FIG. 9. FIG. 9 is a diagram of a second embodiment of the present invention wherein the image-capturing device 30 is transmitting files to a computer device 52. The computer device 52 comprises a receiving module 54 for receiving information sent from the transmitting module 50 of the image-capturing device 30, a control module 56 for controlling the operation of the computer device 52, and a memory module 58 for storing information. Please refer to FIG. 10. FIG. 10 is a file management flow chart of the image-capturing device 30 transmitting files to the computer device 52. The method comprises the following steps:

Step 106: The hot key 40 of the control button set 38 is used to take a file that is stored in the memory device 48 of the image-capturing device 30 and that is in the file folder corresponding to the shortcut command of said hot key and to send it via the transmitting module 50 to the computer device 52.

Step 108: After the receiving module 54 of the computer device 52 receives file information sent from the transmitting module 50, the control module 56 automatically creates in the memory module 58 a file folder corresponding to the file type of the file sent in step 106.

Step 110: After step 108 is executed, the file information received by the receiving module 54 is stored in the file folder generated in step 108.

For example, if the image-capturing device 30 transmits a picture file (such as a file type having a .jpg, .gif, or .bmp file extension) to the computer device 52, the control module will, after the receiving module 54 has received said file, automatically create in the memory module 58 a file folder corresponding to said picture file, e.g. a file folder called "My Picture Files," and store said files in the "My Picture Files" file folder. Of if a video file (such as a file type having an .avi or .mpg file extension) is received, the control module will, after the receiving module 54 has received said file, automatically create in the memory module 58 a file folder corresponding to

said video file, e.g. a file folder called "My Video Files," and store said file in the "My Video Files" file folder.

Because the computer device 52 terminal has large-capacity memory, such as a hard disk drive or an optical disk drive, it can serve as an optimal storage backup space for other portable digital devices, such as digital cameras. When the user connects the image-capturing device to the computer device 52, the file management system between the image-capturing device 30 terminal and the computer device 52 terminal can, because of the inter-correspondence between the terminals, facilitate user exchange and transmission of information between the image-capturing device 30 and the computer device 52.

Please refer to FIG. 11. FIG. 11 is a file management diagram of the image-capturing device 30 transmitting a file to the computer device 52. If the user wishes to transmit a photograph DC001 from the image-capturing device 30 to the computer device 52 for backup, the DC001 file will, in the transmission process, be automatically transmitted from the "My Picture Files" file folder stored in the memory device 48 of the image-capturing device 30 to the "My Picture Files" file folder stored in the memory module 58 of the computer device 52. In other words, the transmission terminal will automatically transmit the file into the corresponding file folder of the receiving terminal. In this way, file transmission and file classification can be simultaneously achieved. Conversely, if the computer device 52 transmits a photograph to the image-capturing device 30, said photograph will be automatically transmitted from the "My Picture Files" file folder stored in the memory module 58 of the computer device 52 into the "My Picture Files" file folder stored in the memory device 48 of the image-capturing device 30.

The digital device applied in the method of the present invention can be a portable digital device, such as a digital camera, a mobile telephone, or a digital camcorder, other than the image-capturing device 30. The method of the present invention also provides file management and file transmission methods for these different types of digital devices.

In comparison with conventional file management methods, the present invention is characterized by the fact that it provides a method of creating file folders corresponding to the file types of files generated under various operating modes of a digital device and of storing files acquired by said digital device in the generated file folders according to the file types corresponding to the operating modes of said digital device. In this way, one can achieve effective file classification and management by storing files in file folders corresponding to categories based on file types without having, as is the case with a traditional digital camera, to waste much precious time browsing and selecting files one by one in order to determine which files one wants. In addition, with respect to the sharing of multimedia file information, users can, with the method of the present invention, use the same kind of file classification system to perform simple, single-key sharing and transmitting of file information between different portable digital devices. Thus, the method can improve the situation in which the differences between the file management systems of digital devices of various, different types result in obstacles to the exchange and transmission of information between various, different types of digital devices. This is thanks to the convenience created by the architecture of the classificatory file management system of the present invention. Furthermore, with respect to file storage and backup, because computer equipment has large-capacity memory, it can serve as an optimal storage backup space for other portable digital devices, such as digital cameras. The file management system between the image-capturing device 30 terminal and the computer device 52 terminal can, because of the inter-correspondence between the terminals, facilitate user exchange

and transmission of information between the image-capturing device 30 and the computer device 52. The backup information on the computer device 52 terminal can be stored using the same file management architecture. In this way, the goal of effective file management is achieved.

The above are merely preferred embodiments of the present invention. All modifications and revisions made according to the claims of the present invention are within the scope of the present invention patent.



## **Concise Description of the Drawings**

## **Concise Description of the Drawings**

FIG. 1 is a front view of a conventional digital camera.

FIG. 2 is a rear view of the digital camera of FIG. 1.

FIG. 3 is a diagram, shown through an electronic viewfinder, of files stored in the digital camera of FIG. 2.

FIG. 4 is a front view of an image-capturing device of the present invention.

FIG. 5 is a rear view of an image-capturing device of the present invention.

FIG. 6 is a functional diagram of an image-capturing device.

FIG. 7 is a file management flow chart of a first embodiment of an image-capturing device.

FIG. 8 is a diagram of file folders that are stored in the memory device of the image-capturing device and that correspond to the various operating modes.

FIG. 9 is a diagram of a second embodiment of the present invention wherein the image-capturing device is transmitting files to a computer device.

FIG. 10 is a file management flow chart of the image-capturing device transmitting files to the computer device.

FIG. 11 is a file management diagram of the image-capturing device transmitting files to the computer device.

## **Explanation of the Drawing Codes**

10 Digital camera	12 Lens
14 Optical viewfinder	16 Shutter button
18 Electronic viewfinder	20 Control button set
30 Image-capturing device	32 Lens
34 Optical viewfinder	36 Electronic viewfinder
38 Control button set	40 Hot key
42 Control module selection knob	43 Image-capturing module
44 Image sensor	45 Audio-recording module
46 Control unit	47 File folder-generating module
48 Memory device	50 Transmitting module
52 Computer device	54 Receiving module
56 Control module	58 Memory module

## VI. Claims

1. A file management method for a digital device, comprising the steps below:
  - (a) creating file folders corresponding to file types of files generated under various operating modes of said digital device; and
  - (b) storing files, which were acquired by said digital device, in the file folders generated in step (a), according to the file types corresponding to the operating modes of said digital device.
2. The method as described in claim 1, further comprising the use of application programs corresponding to the names of the file folders generated in step (a) to open files stored in said digital device.
3. The method as described in claim 1, wherein step (a) is, when selecting the operating mode for said digital device, the automatic creation under said operating mode of files corresponding to the file types of files generated by said operating modes.
3. The method as described in claim 1, wherein said operating mode comprises a picture-taking mode.
4. The method as described in claim 1, wherein said operating mode comprises a video mode.
5. The method as described in claim 1, wherein said operating mode comprises an audio-recording mode.
6. The method as described in claim 1, wherein step (a) is, when said digital device captures a piece of information, the automatic creation of a file folder corresponding to the type of said piece of information.
7. The method as described in claim 6, wherein said digital device makes use of an image-capturing module to capture image information and automatically creates a file folder corresponding to said image file type.
8. The method as described in claim 6, wherein said digital device makes use of an audio-recording module to capture audio information and automatically creates a file folder corresponding to said audio file type.

9. The method as described in claim 1, wherein step (b) is comparing the file folder names generated in step (a) with the file extensions and storing the files corresponding to the various operating modes of said digital device in the file folders generated in step (a).
10. The method as described in claim 1, further comprising the setting of a shortcut command, such that when said shortcut command is executed, the file stored in the corresponding file folder is transmitted to another digital device.
11. The method as described in claim 10, wherein, when said shortcut command is executed, all files of the same type stored in the corresponding file folder are transmitted to another digital device.
12. The method as described in claim 10, wherein said shortcut command is executed by a hot key input method.
13. The method as described in claim 10, wherein said other digital device is a computer device.
14. The method as described in claim 10, wherein the files stored in the corresponding file folder are transmitted by wireless network technology to another digital device.
15. The method as described in claim 14, wherein said wireless network technology employs the Bluetooth wireless area network protocol.
16. The method as described in claim 14, wherein said wireless network technology employs infrared transmission.
17. The method as described in claim 10, wherein the files stored in the corresponding file folders are transmitted by a cable to another digital device.
18. The method as described in claim 1, further comprising: when files of a certain type stored in a file folder are transmitted to another digital device, automatically creating in said other digital device a file folder corresponding to files of said type.
19. The method as described in claim 18, wherein said other digital device is a computer device.

20. The method as described in claim 1, wherein said digital device is a digital camera.
21. The method as described in claim 1, wherein said digital device is a mobile telephone.
22. The method as described in claim 1, wherein said digital device is a digital camcorder.
23. A digital device for implementing the method as described in claim 1.
24. A digital device, having a plurality of operating modes, said digital device comprising:  
a receiving module, for capturing files;  
a control module, for switching between the various operating modes of said digital device;  
a file folder-generating module for creating file folders corresponding to the file types of files generated under the various operating modes of said digital device; and  
a memory module for storing files, in accordance with the file types of files acquired by said receiving module, in the corresponding file folders generated by said file folder-generating module.
25. The device as described in claim 24, wherein said operating mode comprises a picture-taking mode.
26. The device as described in claim 24, wherein said operating mode comprises a video mode.
27. The device as described in claim 24, wherein said operating mode comprises an audio-recording mode.
28. The device as described in claim 24, further comprising a hot key, said hot key transmitting files stored in the corresponding file folder to another digital device upon being triggered.
29. The device as described in claim 24, wherein said digital device is a digital camera.
30. The device as described in claim 24, wherein said digital device is a mobile telephone.
31. The device as described in claim 24, wherein said digital device is a digital camcorder.



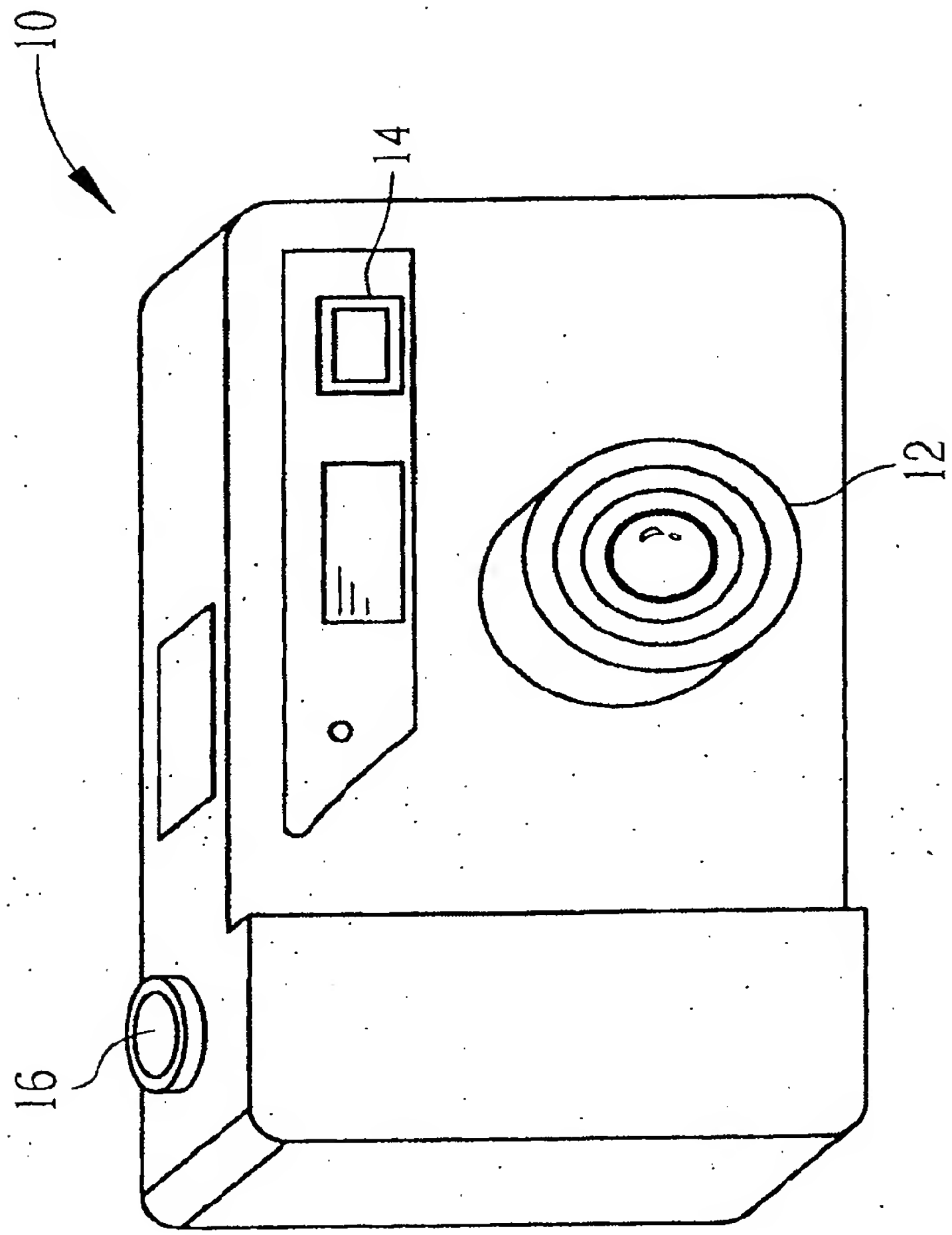


FIG. 1

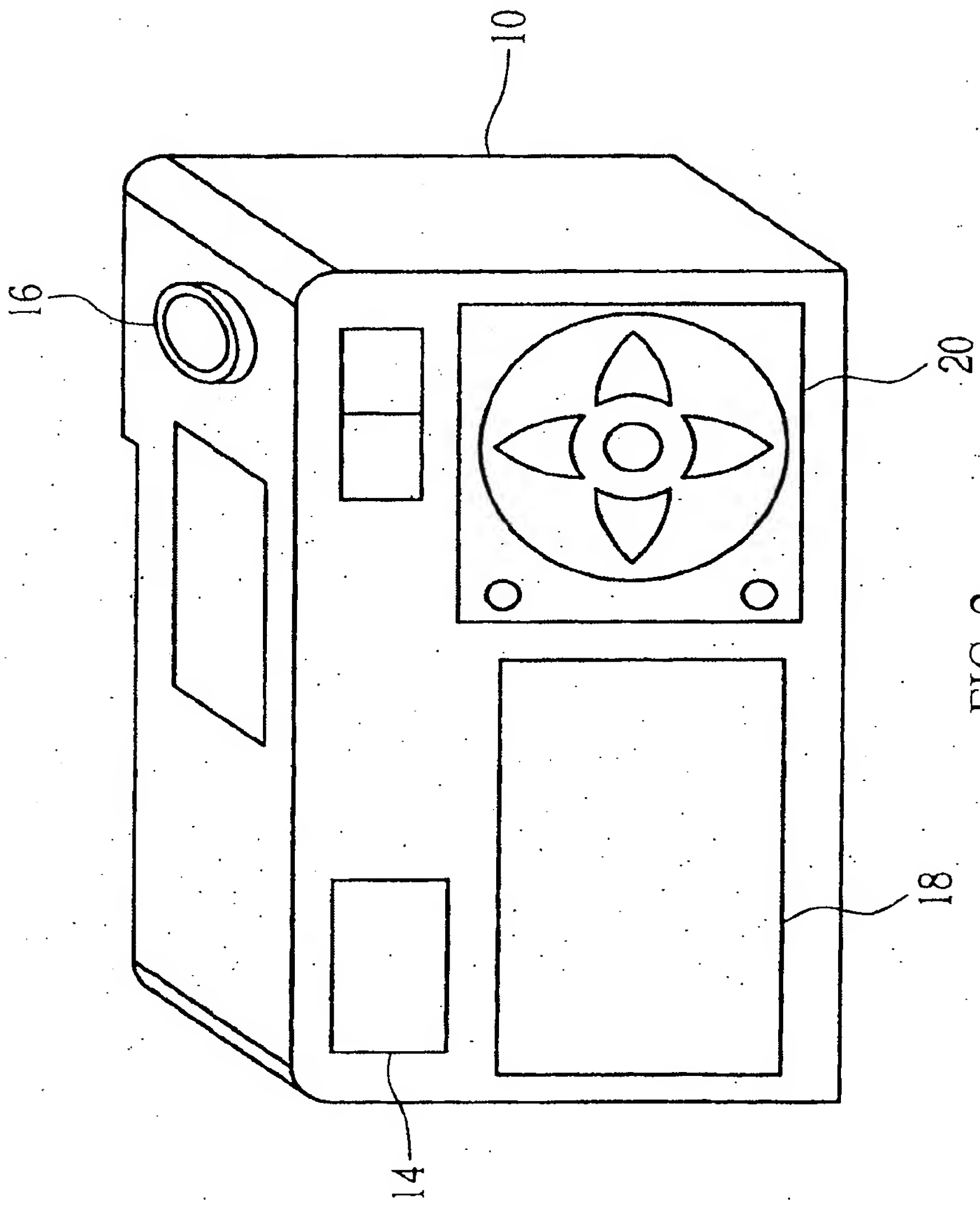


FIG. 2

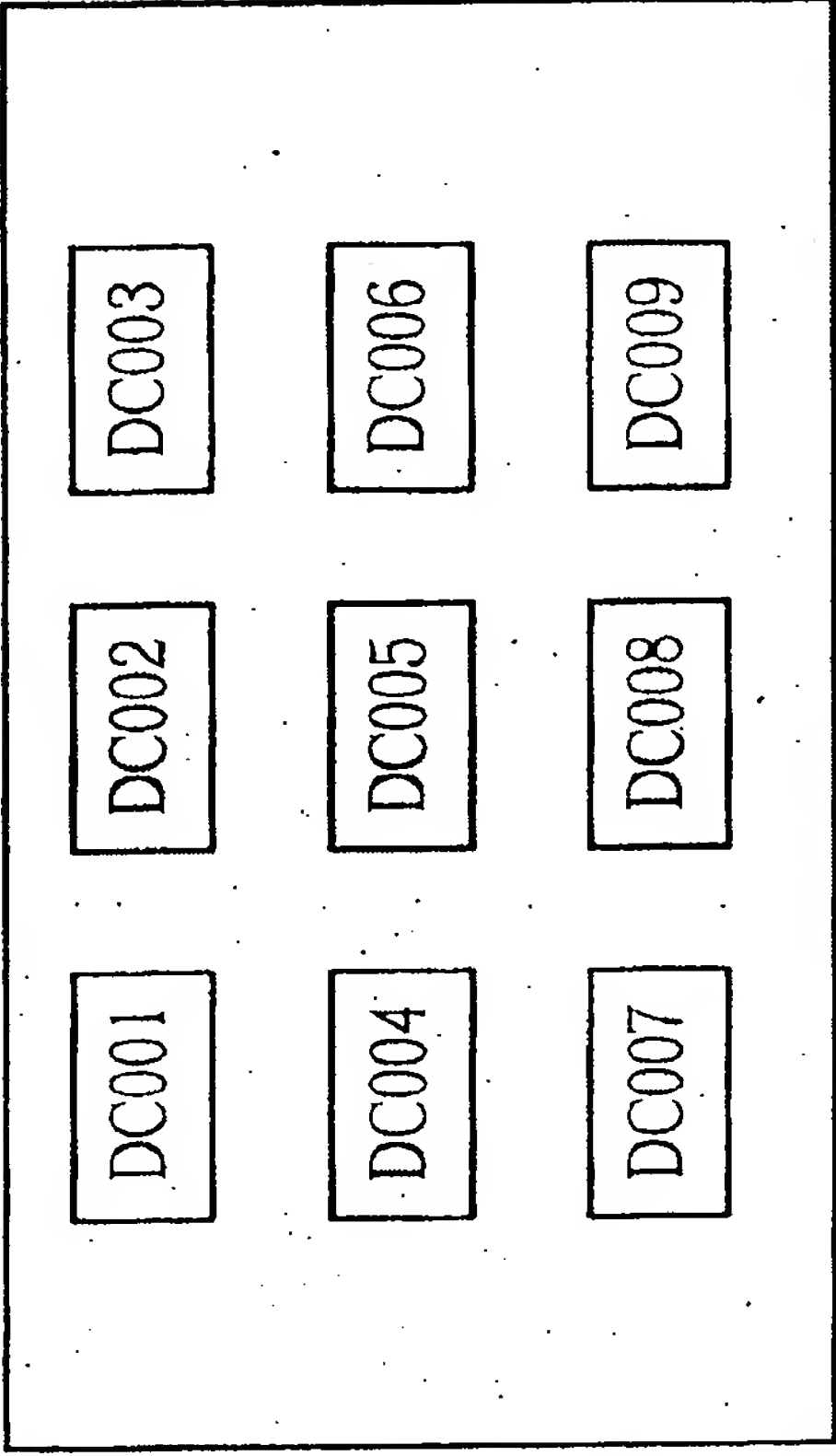


FIG. 3

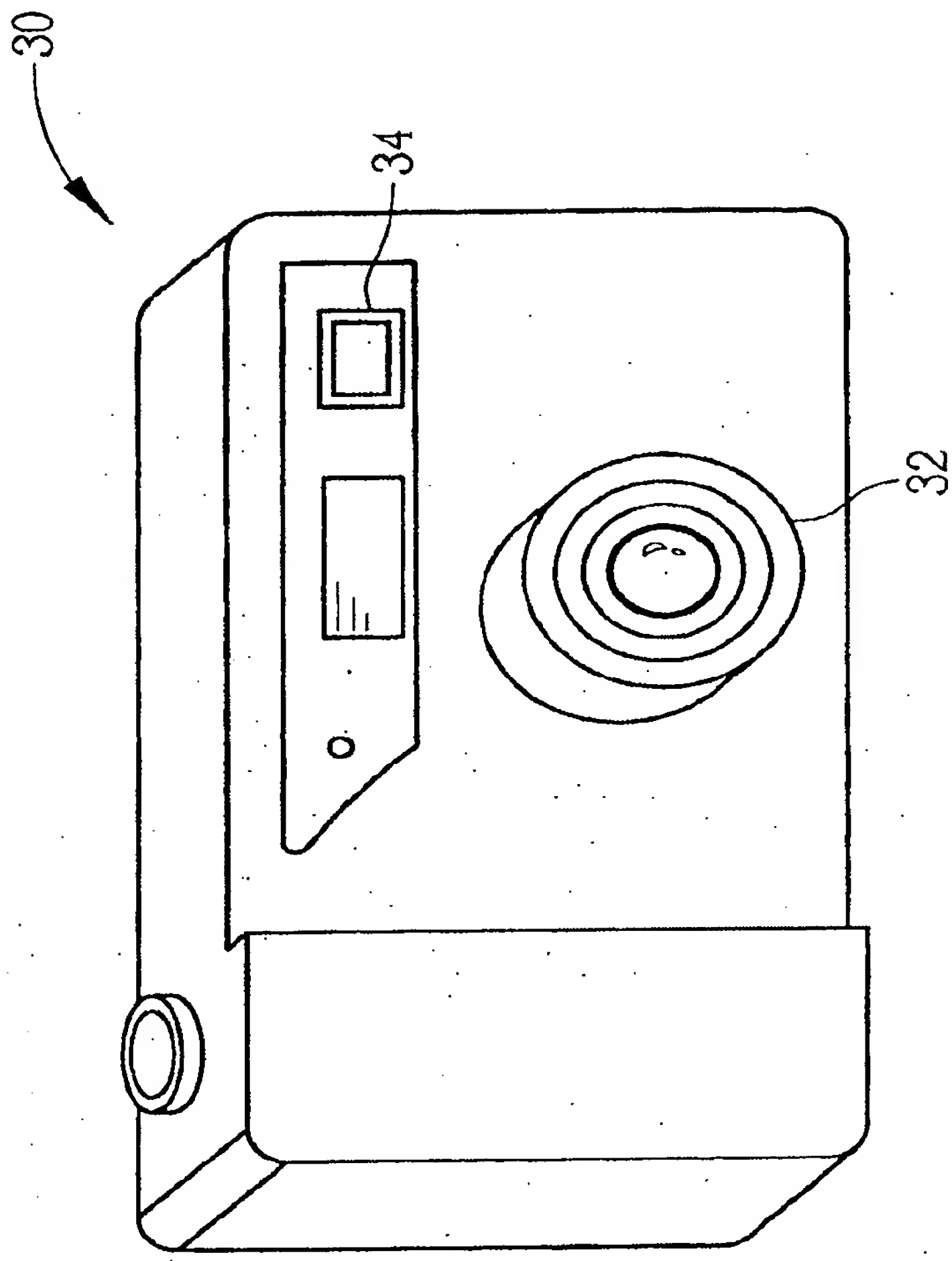


FIG. 4



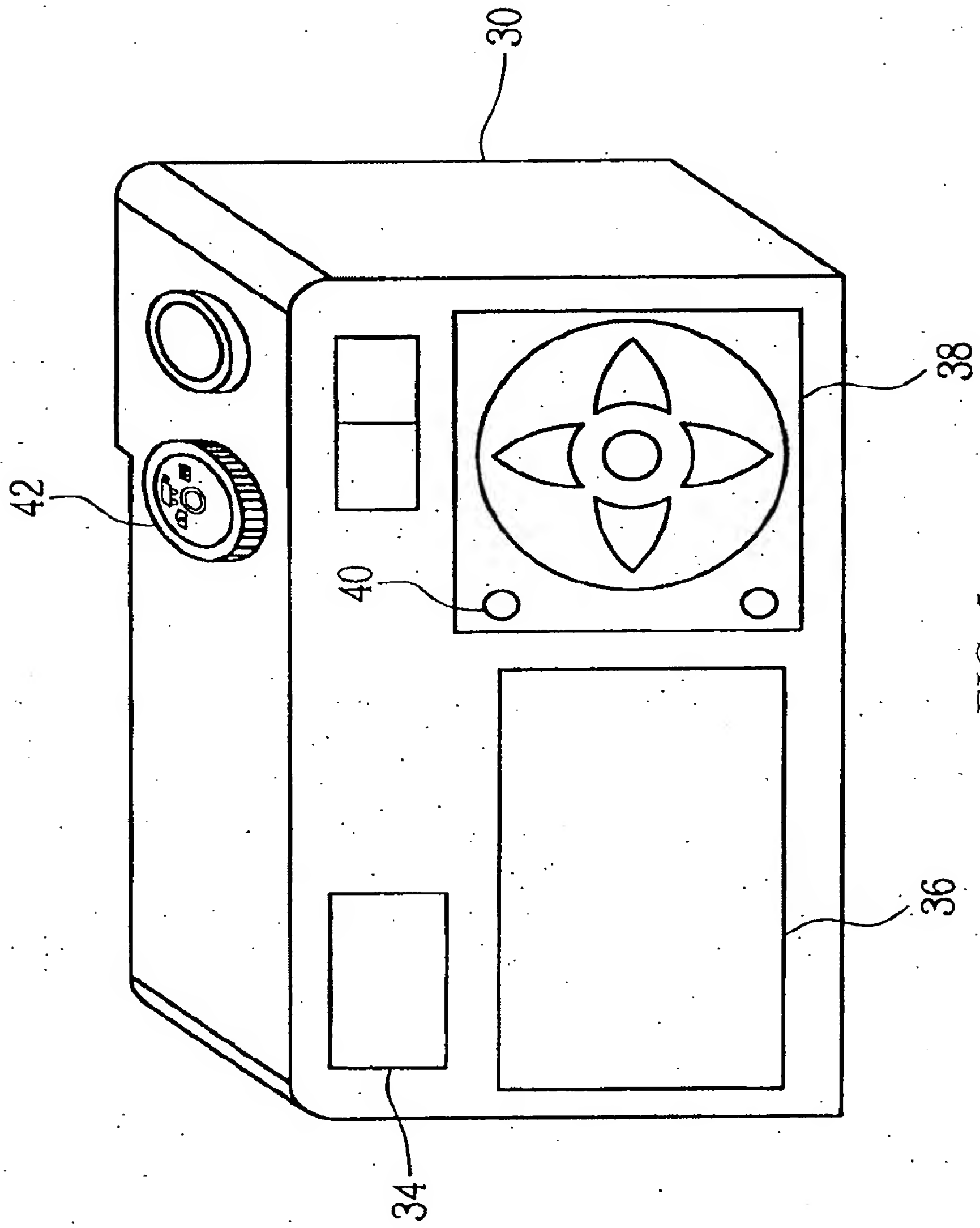


FIG. 5

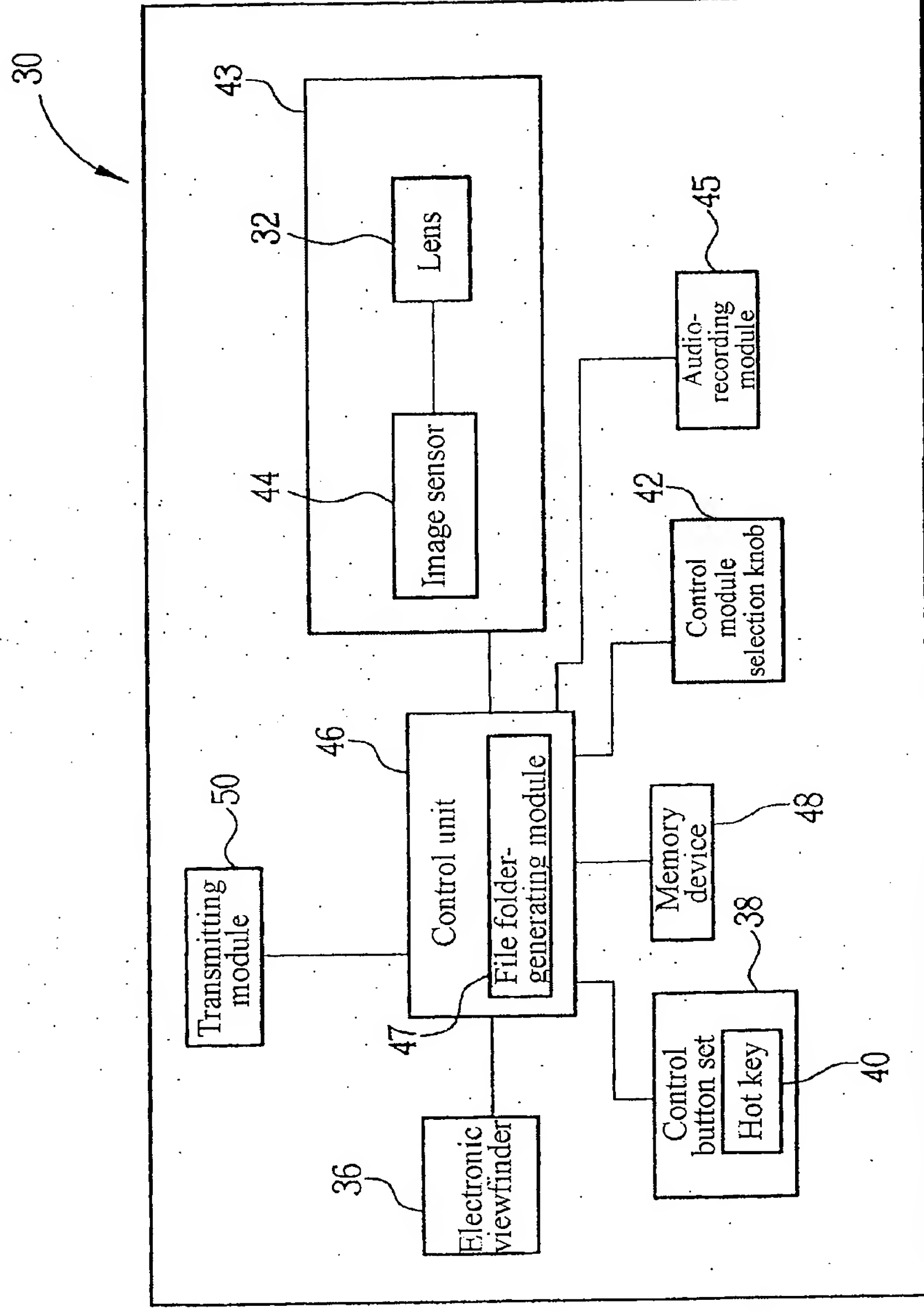


FIG. 6

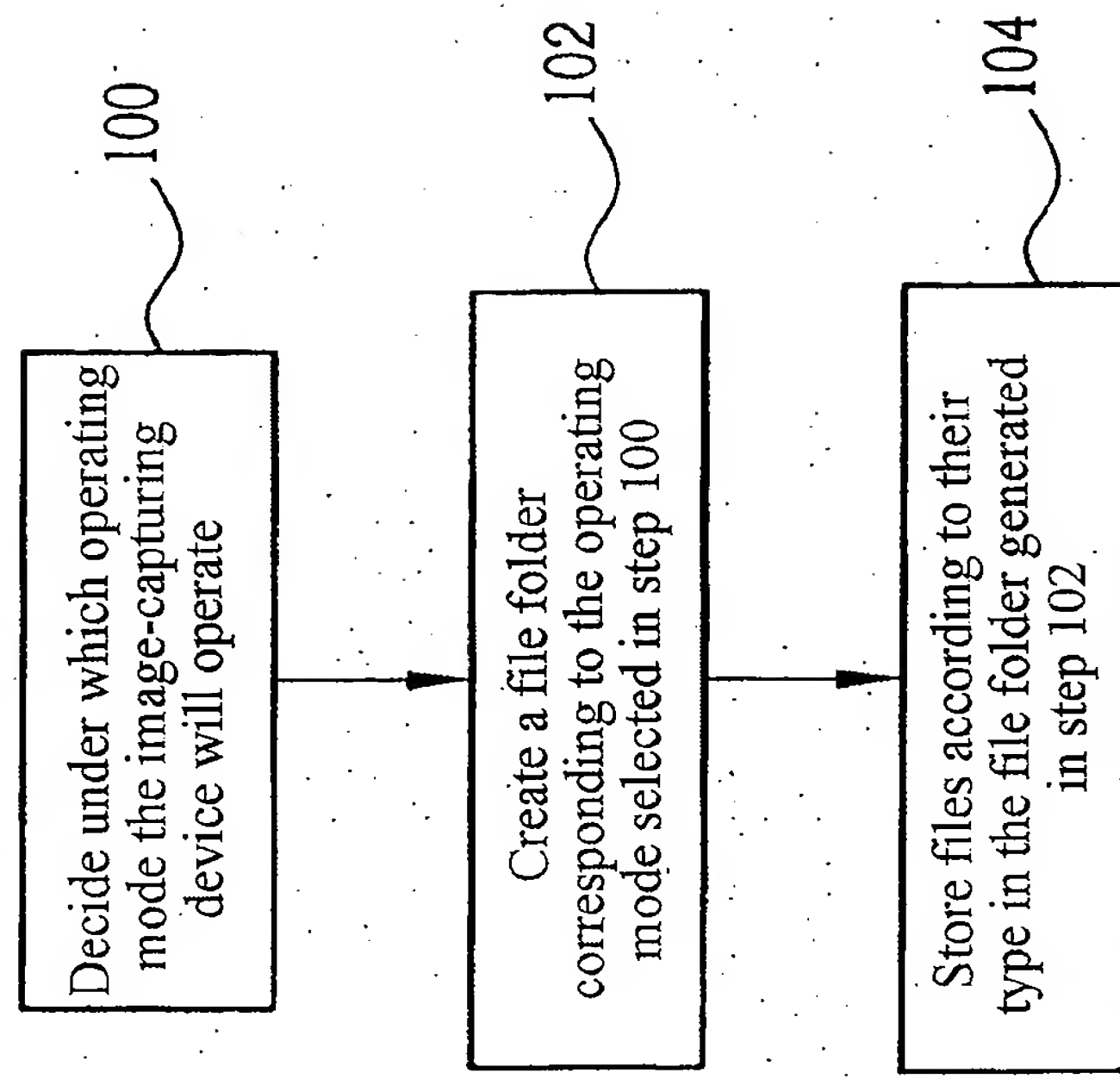


FIG. 7

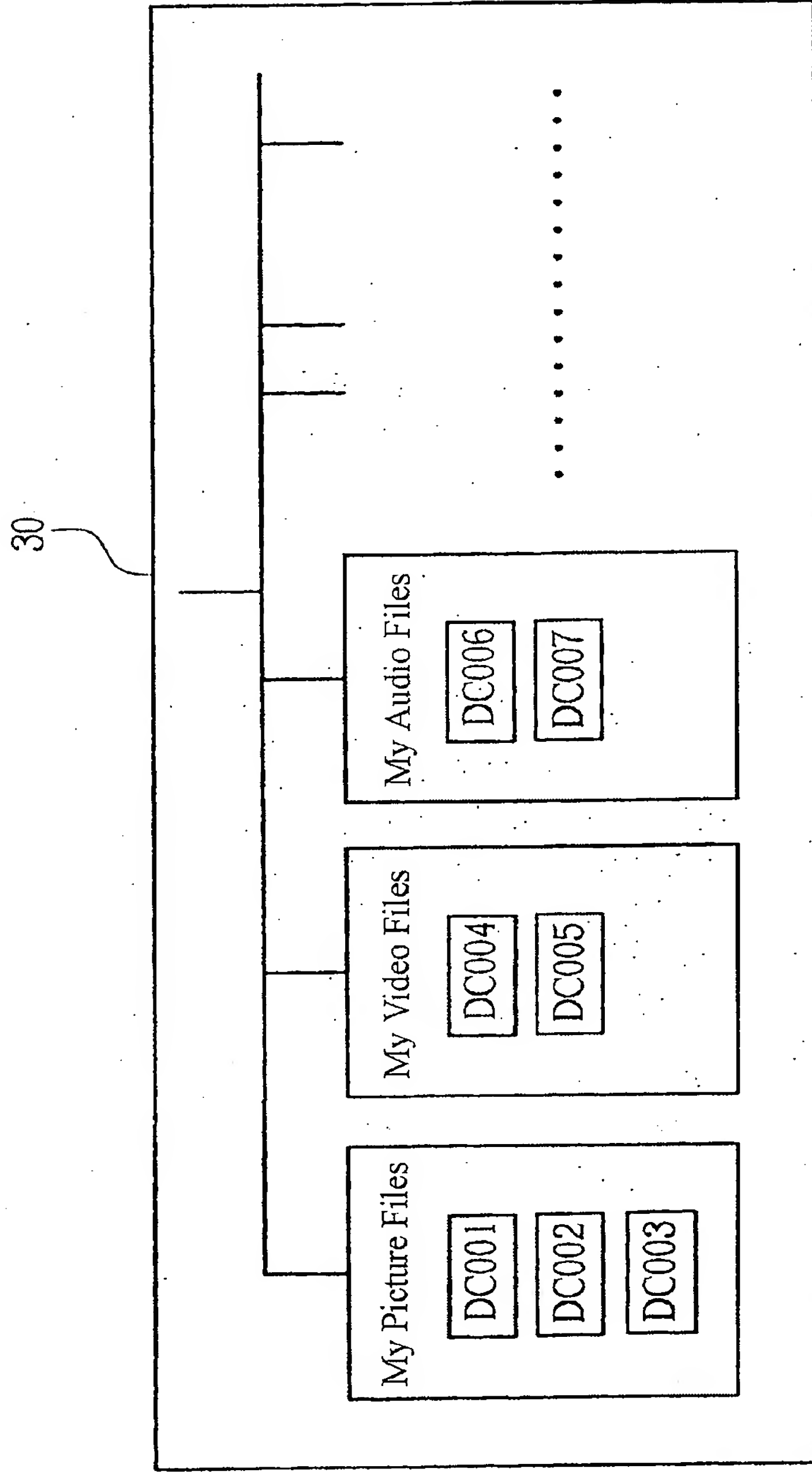


FIG. 8



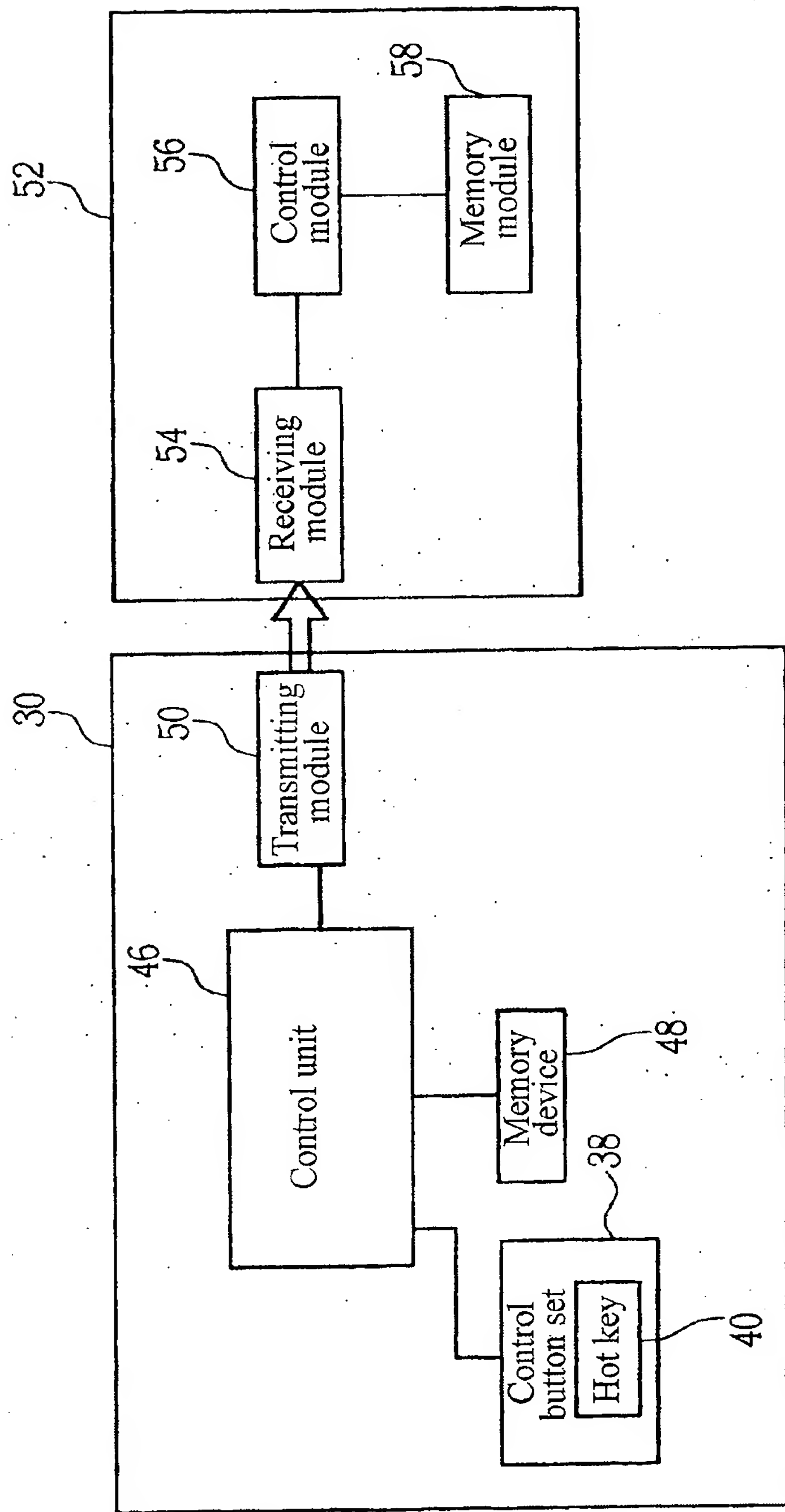


FIG. 9

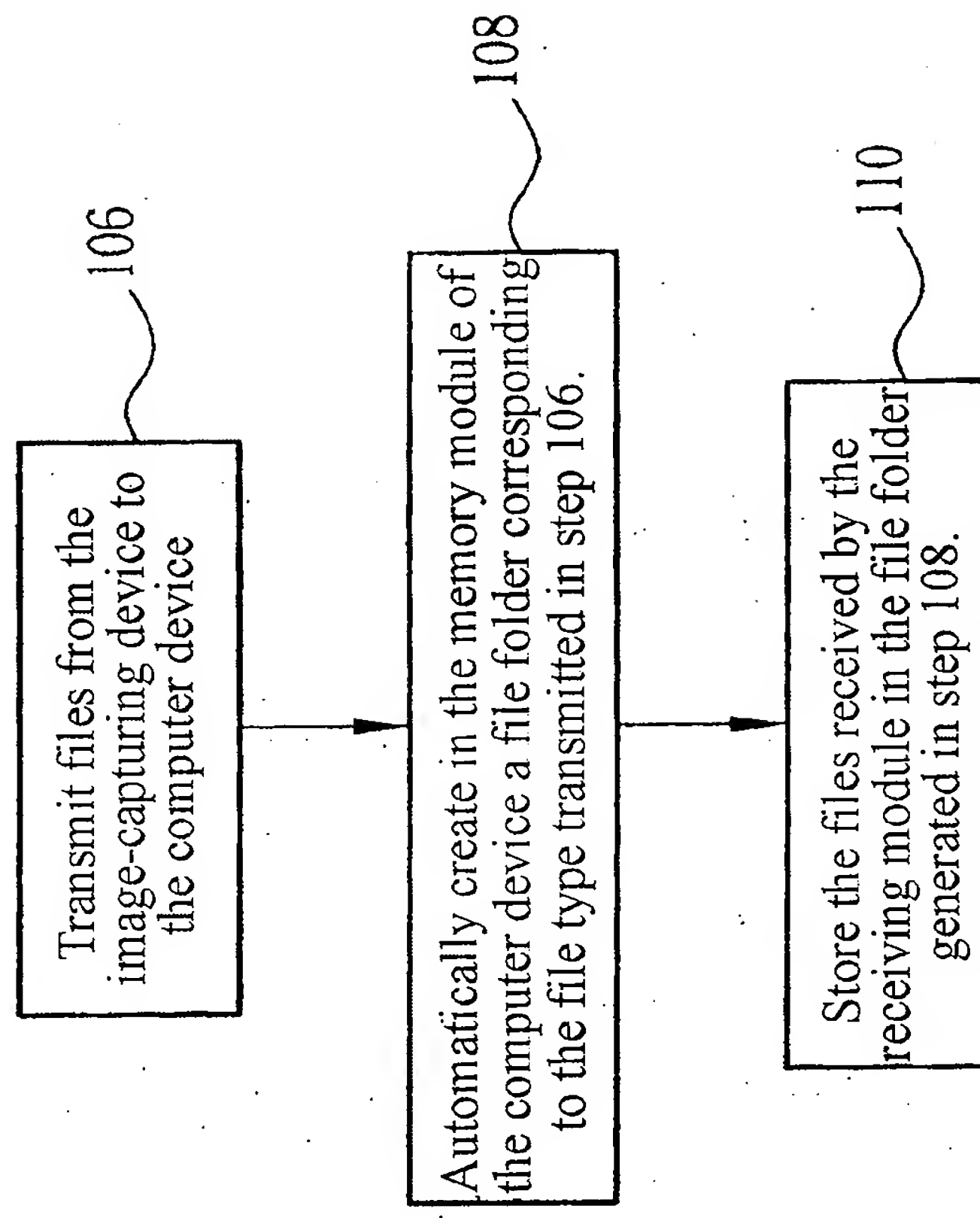


FIG. 10

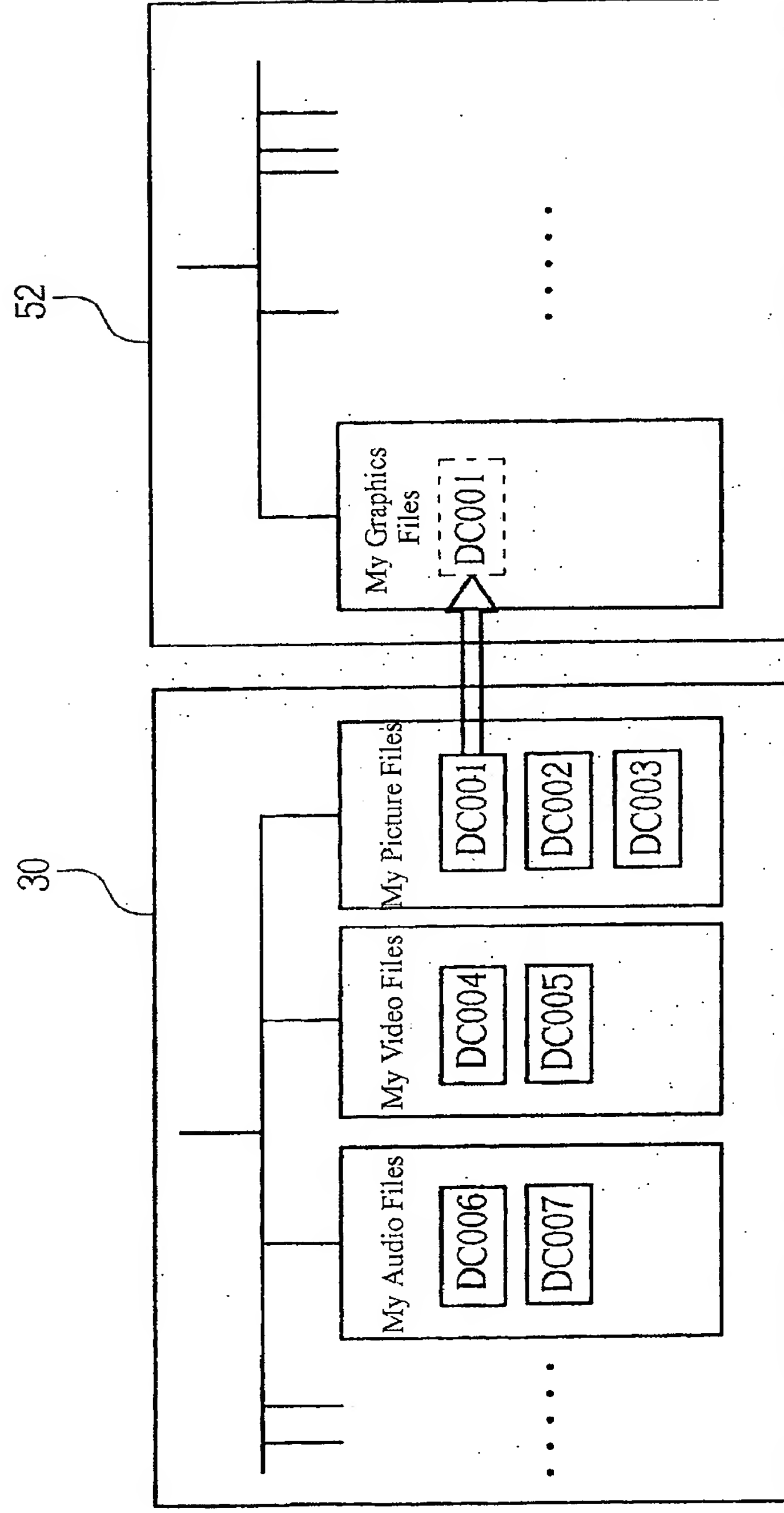


FIG. 11